SEQUENCE LISTING

<110> Min, Kyung-Tai
      Benzer, Seymour

<120> METHODS AND COMPOSITIONS FOR MODULATING
      NEURODEGENERATION

<130> 06618-367001

<140> US 09/418,963
<141> 1999-10-14

<150> US 60/104,298
<151> 1998-10-14

<160> 4

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 2502
<212> DNA
<213> Drosophila melanogaster

<220>
<221> CDS
<222> (161)...(2107)

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aaatagacgg caatcgattt gcgtgaccaa agaacaaata tatacataca tatatcgaga   120
acgccgtaga aacaccaaac tagttaatta tccttgcaac atg tcc acg ata gac   175
                                                  Met Ser Thr Ile Asp
                                                  1   5

gcg ctc tac aat cgt cct ggg ccc aac cgc ctg cgg cag gcg gat gcc   223
Ala Leu Tyr Asn Arg Pro Gly Pro Asn Arg Leu Arg Gln Ala Asp Ala
                10   15   20

tat cgc acc acc aat cgt cag gat gcc gtc aag att cgt atg gcc aag   271
Tyr Arg Thr Thr Asn Arg Gln Asp Ala Val Lys Ile Arg Met Ala Lys
                25   30   35

gat gga atc ggc gca gag gag ccc atc tcc gtg ccc ggc ctg ctg aag   319
Asp Gly Ile Gly Ala Glu Glu Pro Ile Ser Val Pro Gly Leu Leu Lys
                40   45   50

cgt acg gtc aac aat tat ggc gac tat cct gcg ctg cgc acc aag aac   367
Arg Thr Val Asn Asn Tyr Gly Asp Tyr Pro Ala Leu Arg Thr Lys Asn
    55   60   65

ggc aag aac gga tat cac act gtc acc tac aaa caa tat gag cag aag   415
Gly Lys Asn Gly Tyr His Thr Val Thr Tyr Lys Gln Tyr Glu Gln Lys
70   75   80   85

```
gtg cac cag gtg gcc aag gcg ttc att aag ctc ggt ctg gag gag cac        463
Val His Gln Val Ala Lys Ala Phe Ile Lys Leu Gly Leu Glu Glu His
                90                  95                  100

cat tcg gtg ggt gtg ctg gcc ttc aat tgc gcc gaa tgg ttc tac tcg        511
His Ser Val Gly Val Leu Ala Phe Asn Cys Ala Glu Trp Phe Tyr Ser
                105                 110                 115

gcc atg ggc gcc att cac gca cga ggc atc atc gcc gga atc tac acc        559
Ala Met Gly Ala Ile His Ala Arg Gly Ile Ile Ala Gly Ile Tyr Thr
                120                 125                 130

acc aat tcc gcc gat gca gtg cag cac gtt ctg gag agc tca cat gcc        607
Thr Asn Ser Ala Asp Ala Val Gln His Val Leu Glu Ser Ser His Ala
    135                 140                 145

caa atc gtg gtc gtc gac gac gcc aag caa atg gac aag att cac gcc        655
Gln Ile Val Val Val Asp Asp Ala Lys Gln Met Asp Lys Ile His Ala
150                 155                 160                 165

att cgc gac aag ctg ccc aag ctc aag gcc gcc att cag atc cag gag        703
Ile Arg Asp Lys Leu Pro Lys Leu Lys Ala Ala Ile Gln Ile Gln Glu
                170                 175                 180

ccc tat tcc ccc tac ttg aag aag gag gat ggc tac tac agg tgg tcg        751
Pro Tyr Ser Pro Tyr Leu Lys Lys Glu Asp Gly Tyr Tyr Arg Trp Ser
                185                 190                 195

gag atc gag tcg atg aac gtt agc gac gtg gag gat cag tac atg acc        799
Glu Ile Glu Ser Met Asn Val Ser Asp Val Glu Asp Gln Tyr Met Thr
                200                 205                 210

cgt ttg gag aat gtg gcg atc aac gag tgc tgc tgc ctg gtc tac acc        847
Arg Leu Glu Asn Val Ala Ile Asn Glu Cys Cys Cys Leu Val Tyr Thr
    215                 220                 225

tcc gga acg gtg ggc atg ccc aag ggc gtg atg ctc tcc cac gac aac        895
Ser Gly Thr Val Gly Met Pro Lys Gly Val Met Leu Ser His Asp Asn
230                 235                 240                 245

atc acc ttc gat gtg cgc ggc atc gtc aag gcc atg gac cgt gtg gtg        943
Ile Thr Phe Asp Val Arg Gly Ile Val Lys Ala Met Asp Arg Val Val
                250                 255                 260

gtt ggg gcg gag tcg atc gtc tcc tac ctg cca ctt tcg cac gtg gcc        991
Val Gly Ala Glu Ser Ile Val Ser Tyr Leu Pro Leu Ser His Val Ala
                265                 270                 275

gcc cag acc gtg gac att tac acc tgc gcc ttt gtg gcg ggc tgc att       1039
Ala Gln Thr Val Asp Ile Tyr Thr Cys Ala Phe Val Ala Gly Cys Ile
                280                 285                 290

tgg ttc gcc gac aag gat gcg ctg aag gga acg ctg gtg aag tcg ttg       1087
Trp Phe Ala Asp Lys Asp Ala Leu Lys Gly Thr Leu Val Lys Ser Leu
                295                 300                 305

cag gat gcg cga ccc acg cga ttc atg ggc gtg ccg cgt gtg tac gag       1135
```

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Gln Asp Ala Arg Pro Thr Arg Phe Met Gly Val Pro Arg Val Tyr Glu
310             315             320             325

aag ttc cag gag cga atg gtc gcc gtg gcc agc tcc agc ggc agc ctg      1183
Lys Phe Gln Glu Arg Met Val Ala Val Ala Ser Ser Ser Gly Ser Leu
                330             335             340

aag aag atg ctc gcc agc tgg gcc aag ggc atc acg ctg aag cac tac      1231
Lys Lys Met Leu Ala Ser Trp Ala Lys Gly Ile Thr Leu Lys His Tyr
            345             350             355

atg gtg agt caa ggc aag agc tcc ggg gga ttc cgg tac aag att gcc      1279
Met Val Ser Gln Gly Lys Ser Ser Gly Gly Phe Arg Tyr Lys Ile Ala
        360             365             370

aag tcg ctc atc atg tcc aag gtg aag cag gcc ctg ggc ttc gat cgc      1327
Lys Ser Leu Ile Met Ser Lys Val Lys Gln Ala Leu Gly Phe Asp Arg
    375             380             385

gtc ctt aca ctg gcc agt gcg gca gct ccc atg tcg ccg gag acg aag      1375
Val Leu Thr Leu Ala Ser Ala Ala Ala Pro Met Ser Pro Glu Thr Lys
390             395             400             405

aag tac ttc ctc agt ctg gac cta aag att gtc gat gcc ttc ggc atg      1423
Lys Tyr Phe Leu Ser Leu Asp Leu Lys Ile Val Asp Ala Phe Gly Met
                410             415             420

tca gaa acg gcc ggt tgt cac acc atc tgc ctt ccc gat tcc gtg ggt      1471
Ser Glu Thr Ala Gly Cys His Thr Ile Cys Leu Pro Asp Ser Val Gly
            425             430             435

ctg aac aca atc ggc aaa act ttg ccc ggc tgc gag tcc aag ttc atc      1519
Leu Asn Thr Ile Gly Lys Thr Leu Pro Gly Cys Glu Ser Lys Phe Ile
        440             445             450

aac aag gat gcc aac ggt cac gga gag ctg tgc atc cga gga cgt cac      1567
Asn Lys Asp Ala Asn Gly His Gly Glu Leu Cys Ile Arg Gly Arg His
    455             460             465

gtt ttc atg ggc tac atc gac aac aag gag aag acc gag gag tcg ctg      1615
Val Phe Met Gly Tyr Ile Asp Asn Lys Glu Lys Thr Glu Glu Ser Leu
470             475             480             485

gat gac gac tgc tgg ctg cat tcc ggt gat ttg gga ttt gtg gat gac      1663
Asp Asp Asp Cys Trp Leu His Ser Gly Asp Leu Gly Phe Val Asp Asp
            490             495             500

aag ggt tat gtt tca ctg acg gga cga tcc aag gag atc atc att acc      1711
Lys Gly Tyr Val Ser Leu Thr Gly Arg Ser Lys Glu Ile Ile Ile Thr
        505             510             515

gcc ggc ggc gag aac ata ccg cca gtg cac atc gag aac acg atc aag      1759
Ala Gly Gly Glu Asn Ile Pro Pro Val His Ile Glu Asn Thr Ile Lys
        520             525             530

aag gag ctg gat gcc att tcc aat gcc ttt ttg gtg ggc gag cag cgc      1807
Lys Glu Leu Asp Ala Ile Ser Asn Ala Phe Leu Val Gly Glu Gln Arg
```

```
       535                    540                    545

aaa tat ctc act gtt ctg atc acc cta aag acc gaa gtg gac aag gat    1855
Lys Tyr Leu Thr Val Leu Ile Thr Leu Lys Thr Glu Val Asp Lys Asp
550                     555                    560                 565

tcc ggt gag ccg ctg gac gag ctt agc cac gag tcc tcc gtg tgg gtg    1903
Ser Gly Glu Pro Leu Asp Glu Leu Ser His Glu Ser Ser Val Trp Val
                    570                    575                    580

aaa tcg ctg gga gtg gag cac aag acc gta tcg gat atc ctg gcc gca    1951
Lys Ser Leu Gly Val Glu His Lys Thr Val Ser Asp Ile Leu Ala Ala
                585                    590                    595

ggt ccc tgc ccc aag gtg tgg aag tcc atc gag gat gcc att aag cgg    1999
Gly Pro Cys Pro Lys Val Trp Lys Ser Ile Glu Asp Ala Ile Lys Arg
            600                    605                    610

gcc aac aag cag tcc att tcc aat gcc caa aag gtt cag aag ttc acc    2047
Ala Asn Lys Gln Ser Ile Ser Asn Ala Gln Lys Val Gln Lys Phe Thr
        615                    620                    625

att ctg ccg cac gac ttc tcc att ccc acc ggc gaa ctt gga ccc acc    2095
Ile Leu Pro His Asp Phe Ser Ile Pro Thr Gly Glu Leu Gly Pro Thr
630                     635                    640                 645

cac cct aaa ggt taagcgcaac gttgtgtcca agatgtatgc cgatgagatc        2147
His Pro Lys Gly
```

```
gagaaactat atgcctagat ttctcactgc aagatcgaaa ccgatgatag ccgcggaact    2207
tgagctttaa tgtgaatttg aatttaacgg acttccaagc caattgagtg ccacttttaa    2267
tttgatttag gctgatgtta actgttggat attaaactaa gaacaactat ggccctatgc    2327
ctaggtagac acgagcttgc caacgattag gtccagagat catttaatta gtaactaagt    2387
tttatttttt atatactatt tggttgtacc aactgaacaa acgaaaattg tttattgtct    2447
gaagagcaac aataaatttg taattagatt aactaccaaa aaaaaaaaaa aaaaa          2502
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<211> 649
<212> PRT
<213> Drosophila melanogaster

<400> 2
Met Ser Thr Ile Asp Ala Leu Tyr Asn Arg Pro Gly Pro Asn Arg Leu
 1               5                   10                  15
Arg Gln Ala Asp Ala Tyr Arg Thr Thr Asn Arg Gln Asp Ala Val Lys
            20                  25                  30
Ile Arg Met Ala Lys Asp Gly Ile Gly Ala Glu Glu Pro Ile Ser Val
        35                  40                  45
Pro Gly Leu Leu Lys Arg Thr Val Asn Asn Tyr Gly Asp Tyr Pro Ala
    50                  55                  60
Leu Arg Thr Lys Asn Gly Lys Asn Gly Tyr His Thr Val Thr Tyr Lys
65                  70                  75                  80
Gln Tyr Glu Gln Lys Val His Gln Val Ala Lys Ala Phe Ile Lys Leu
                85                  90                  95
Gly Leu Glu Glu His His Ser Val Gly Val Leu Ala Phe Asn Cys Ala
            100                 105                 110
```

```
Glu Trp Phe Tyr Ser Ala Met Gly Ala Ile His Ala Arg Gly Ile Ile
    115                 120                 125
Ala Gly Ile Tyr Thr Thr Asn Ser Ala Asp Ala Val Gln His Val Leu
    130                 135                 140
Glu Ser Ser His Ala Gln Ile Val Val Val Asp Asp Ala Lys Gln Met
145                 150                 155                 160
Asp Lys Ile His Ala Ile Arg Asp Lys Leu Pro Lys Leu Lys Ala Ala
            165                 170                 175
Ile Gln Ile Gln Glu Pro Tyr Ser Pro Tyr Leu Lys Lys Glu Asp Gly
            180                 185                 190
Tyr Tyr Arg Trp Ser Glu Ile Glu Ser Met Asn Val Ser Asp Val Glu
        195                 200                 205
Asp Gln Tyr Met Thr Arg Leu Glu Asn Val Ala Ile Asn Glu Cys Cys
    210                 215                 220
Cys Leu Val Tyr Thr Ser Gly Thr Val Gly Met Pro Lys Gly Val Met
225                 230                 235                 240
Leu Ser His Asp Asn Ile Thr Phe Asp Val Arg Gly Ile Val Lys Ala
            245                 250                 255
Met Asp Arg Val Val Val Gly Ala Glu Ser Ile Val Ser Tyr Leu Pro
        260                 265                 270
Leu Ser His Val Ala Ala Gln Thr Val Asp Ile Tyr Thr Cys Ala Phe
        275                 280                 285
Val Ala Gly Cys Ile Trp Phe Ala Asp Lys Asp Ala Leu Lys Gly Thr
    290                 295                 300
Leu Val Lys Ser Leu Gln Asp Ala Arg Pro Thr Arg Phe Met Gly Val
305                 310                 315                 320
Pro Arg Val Tyr Glu Lys Phe Gln Glu Arg Met Val Ala Val Ala Ser
            325                 330                 335
Ser Ser Gly Ser Leu Lys Lys Met Leu Ala Ser Trp Ala Lys Gly Ile
            340                 345                 350
Thr Leu Lys His Tyr Met Val Ser Gln Gly Lys Ser Ser Gly Gly Phe
        355                 360                 365
Arg Tyr Lys Ile Ala Lys Ser Leu Ile Met Ser Lys Val Lys Gln Ala
    370                 375                 380
Leu Gly Phe Asp Arg Val Leu Thr Leu Ala Ser Ala Ala Ala Pro Met
385                 390                 395                 400
Ser Pro Glu Thr Lys Lys Tyr Phe Leu Ser Leu Asp Leu Lys Ile Val
            405                 410                 415
Asp Ala Phe Gly Met Ser Glu Thr Ala Gly Cys His Thr Ile Cys Leu
            420                 425                 430
Pro Asp Ser Val Gly Leu Asn Thr Ile Gly Lys Thr Leu Pro Gly Cys
    435                 440                 445
Glu Ser Lys Phe Ile Asn Lys Asp Ala Asn Gly His Gly Glu Leu Cys
    450                 455                 460
Ile Arg Gly Arg His Val Phe Met Gly Tyr Ile Asp Asn Lys Glu Lys
465                 470                 475                 480
Thr Glu Glu Ser Leu Asp Asp Asp Cys Trp Leu His Ser Gly Asp Leu
            485                 490                 495
Gly Phe Val Asp Asp Lys Gly Tyr Val Ser Leu Thr Gly Arg Ser Lys
            500                 505                 510
Glu Ile Ile Ile Thr Ala Gly Gly Glu Asn Ile Pro Pro Val His Ile
            515                 520                 525
Glu Asn Thr Ile Lys Lys Glu Leu Asp Ala Ile Ser Asn Ala Phe Leu
    530                 535                 540
Val Gly Glu Gln Arg Lys Tyr Leu Thr Val Leu Ile Thr Leu Lys Thr
545                 550                 555                 560
Glu Val Asp Lys Asp Ser Gly Glu Pro Leu Asp Glu Leu Ser His Glu
```

```
                    565                      570                      575
Ser Ser Val Trp Val Lys Ser Leu Gly Val Glu His Lys Thr Val Ser
                580                      585                      590
Asp Ile Leu Ala Ala Gly Pro Cys Pro Lys Val Trp Lys Ser Ile Glu
            595                      600                      605
Asp Ala Ile Lys Arg Ala Asn Lys Gln Ser Ile Ser Asn Ala Gln Lys
        610                      615                      620
Val Gln Lys Phe Thr Ile Leu Pro His Asp Phe Ser Ile Pro Thr Gly
    625                      630                      635                      640
Glu Leu Gly Pro Thr His Pro Lys Gly
                    645


<210> 3
<211> 634
<212> PRT
<213> Homo sapiens


<400> 3
Arg Leu Arg Ile Asp Pro Ser Cys Pro Gln Leu Pro Tyr Thr Val His
    1                   5                      10                      15
Arg Met Phe Tyr Glu Ala Leu Asp Lys Tyr Gly Asp Leu Ile Ala Leu
                20                      25                      30
Gly Phe Lys Arg Gln Asp Lys Trp Glu His Ile Ser Tyr Ser Gln Tyr
            35                      40                      45
Tyr Leu Leu Ala Arg Arg Ala Ala Lys Gly Phe Leu Lys Leu Gly Leu
        50                      55                      60
Lys Gln Ala His Ser Val Ala Ile Leu Gly Phe Asn Ser Pro Glu Trp
    65                      70                      75                      80
Phe Phe Ser Ala Val Gly Thr Val Phe Ala Gly Gly Ile Val Thr Gly
                85                      90                      95
Ile Tyr Thr Thr Ser Ser Pro Glu Ala Cys Gln Tyr Ile Ala Tyr Asp
            100                     105                     110
Cys Cys Ala Asn Val Ile Met Val Asp Thr Gln Lys Gln Leu Glu Lys
        115                     120                     125
Ile Leu Lys Ile Trp Lys Gln Leu Pro His Leu Lys Ala Val Val Ile
        130                     135                     140
Tyr Lys Glu Pro Pro Pro Asn Lys Met Ala Asn Val Tyr Thr Met Glu
    145                     150                     155                     160
Glu Phe Met Glu Leu Gly Asn Glu Val Pro Glu Glu Ala Leu Asp Ala
                165                     170                     175
Ile Ile Asp Thr Gln Gln Pro Asn Gln Cys Cys Val Leu Val Tyr Thr
            180                     185                     190
Ser Gly Thr Thr Gly Asn Pro Lys Gly Val Met Leu Ser Gln Asp Asn
            195                     200                     205
Ile Thr Trp Thr Ala Arg Tyr Gly Ser Gln Ala Gly Asp Ile Arg Pro
        210                     215                     220
Ala Glu Val Gln Gln Glu Val Val Ser Tyr Leu Pro Leu Ser His
    225                     230                     235                     240
Ile Ala Ala Gln Ile Tyr Asp Leu Trp Thr Gly Ile Gln Trp Gly Ala
            245                     250                     255
Gln Val Cys Phe Ala Glu Pro Asp Ala Leu Lys Gly Ser Leu Val Asn
            260                     265                     270
Thr Leu Arg Glu Val Glu Pro Thr Ser His Met Gly Val Pro Arg Val
        275                     280                     285
Trp Glu Lys Ile Met Glu Arg Ile Gln Glu Val Ala Ala Gln Ser Gly
    290                     295                     300
Phe Ile Arg Arg Lys Met Leu Leu Trp Ala Met Ser Val Thr Leu Glu
```

```
305                    310                    315                    320
Gln Asn Leu Thr Cys Pro Gly Ser Asp Leu Lys Pro Phe Thr Thr Arg
                325                    330                    335
Leu Ala Asp Tyr Leu Val Leu Ala Lys Val Arg Gln Ala Leu Gly Phe
                340                    345                    350
Ala Lys Cys Gln Lys Asn Phe Tyr Gly Ala Ala Pro Met Met Ala Glu
                355                    360                    365
Thr Gln His Phe Phe Leu Gly Leu Asn Ile Arg Leu Tyr Ala Gly Tyr
        370                    375                    380
Gly Leu Ser Glu Thr Ser Gly Pro His Phe Met Ser Ser Pro Tyr Asn
385                    390                    395                    400
Tyr Arg Leu Tyr Ser Ser Gly Lys Leu Val Pro Gly Cys Arg Val Lys
                405                    410                    415
Leu Val Asn Gln Asp Ala Glu Gly Ile Gly Glu Ile Cys Leu Trp Gly
                420                    425                    430
Arg Thr Ile Phe Met Gly Tyr Leu Asn Met Glu Asp Lys Thr Cys Glu
            435                    440                    445
Ala Ile Asp Glu Glu Gly Trp Leu His Thr Gly Asp Ala Gly Arg Leu
        450                    455                    460
Asp Ala Asp Gly Phe Leu Tyr Ile Thr Gly Arg Leu Lys Glu Leu Ile
465                    470                    475                    480
Ile Thr Ala Gly Gly Glu Asn Val Pro Pro Val Pro Ile Glu Glu Ala
                485                    490                    495
Val Lys Met Glu Leu Pro Ile Ile Ser Asn Ala Met Leu Ile Gly Asp
                500                    505                    510
Gln Arg Lys Phe Leu Ser Met Leu Leu Thr Leu Lys Cys Thr Leu Asp
                515                    520                    525
Pro Asp Thr Ser Asp Gln Thr Asp Asn Leu Thr Glu Gln Ala Val Glu
            530                    535                    540
Phe Cys Gln Arg Val Gly Ser Arg Ala Thr Thr Val Ser Glu Ile Ile
545                    550                    555                    560
Glu Lys Lys Asp Glu Ala Val Tyr Gln Ala Ile Glu Glu Gly Ile Arg
                565                    570                    575
Arg Val Asn Met Asn Ala Ala Ala Arg Pro Tyr His Ile Gln Lys Trp
            580                    585                    590
Ala Ile Leu Glu Arg Asp Phe Ser Ile Ser Gly Gly Glu Leu Gly Pro
        595                    600                    605
Thr Met Lys Leu Lys Arg Leu Thr Val Leu Glu Lys Tyr Lys Gly Ile
    610                    615                    620
Ile Asp Ser Phe Tyr Gln Glu Gln Lys Met
625                    630
```

```
<210> 4
<211> 620
<212> PRT
<213> Rattus norvegicus
```

```
<400> 4
Met Leu Pro Val Leu Tyr Thr Gly Leu Ala Gly Leu Leu Leu Leu Pro
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Leu Leu Leu Thr Cys Cys Cys Pro Tyr Leu Leu Gln Asp Val Arg Phe
            20                  25                  30
Phe Leu Gln Leu Ala Asn Met Ala Arg Gln Val Arg Ser Tyr Arg Gln
        35                  40                  45
Arg Arg Pro Val Arg Thr Ile Leu His Val Phe Leu Glu Gln Ala Arg
    50                  55                  60
Lys Thr Pro His Lys Pro Phe Leu Leu Phe Arg Asp Glu Thr Leu Thr
```

```
        65                      70                      75                      80
Tyr Ala Gln Val Asp Arg Arg Ser Asn Gln Val Ala Arg Ala Leu His
                    85                      90                      95
Asp His Leu Gly Leu Arg Gln Gly Asp Cys Val Ala Leu Phe Met Gly
            100                     105                     110
Asn Glu Pro Ala Tyr Val Trp Leu Trp Leu Gly Leu Leu Lys Leu Gly
            115                     120                     125
Cys Pro Met Ala Cys Leu Asn Tyr Asn Ile Arg Ala Lys Ser Leu Leu
        130                     135                     140
His Cys Phe Gln Cys Cys Gly Ala Lys Val Leu Leu Ala Ser Pro Glu
145                     150                     155                     160
Leu His Glu Ala Val Glu Glu Val Leu Pro Thr Leu Lys Lys Glu Gly
                    165                     170                     175
Val Ser Val Phe Tyr Val Ser Arg Thr Ser Asn Thr Asn Gly Val Asp
                180                     185                     190
Thr Val Leu Asp Lys Val Asp Gly Val Ser Ala Asp Pro Ile Pro Glu
            195                     200                     205
Ser Trp Arg Ser Glu Val Thr Phe Thr Thr Pro Ala Val Tyr Ile Tyr
        210                     215                     220
Thr Ser Gly Thr Thr Gly Leu Pro Lys Ala Ala Thr Ile Asn His His
225                     230                     235                     240
Arg Leu Trp Tyr Gly Thr Ser Leu Ala Leu Arg Ser Gly Ile Lys Ala
                245                     250                     255
His Asp Val Ile Tyr Thr Thr Met Pro Leu Tyr His Ser Ala Ala Leu
                260                     265                     270
Met Ile Gly Leu His Gly Cys Ile Val Val Gly Ala Thr Phe Ala Leu
                275                     280                     285
Arg Ser Lys Phe Ser Ala Ser Gln Phe Trp Asp Asp Cys Arg Lys Tyr
            290                     295                     300
Asn Ala Thr Val Ile Gln Tyr Ile Gly Glu Leu Leu Arg Tyr Leu Cys
305                     310                     315                     320
Asn Thr Pro Gln Lys Pro Asn Asp Arg Asp His Lys Val Lys Ile Ala
                325                     330                     335
Leu Gly Asn Gly Leu Arg Gly Asp Val Trp Arg Glu Phe Ile Lys Arg
            340                     345                     350
Phe Gly Asp Ile His Ile Tyr Glu Phe Tyr Ala Ser Thr Glu Gly Asn
            355                     360                     365
Ile Gly Phe Met Asn Tyr Pro Arg Lys Ile Gly Ala Val Gly Arg Glu
        370                     375                     380
Asn Tyr Leu Gln Lys Lys Val Val Arg His Glu Leu Ile Lys Tyr Asp
385                     390                     395                     400
Val Glu Lys Asp Glu Pro Val Arg Asp Ala Asn Gly Tyr Cys Ile Lys
                405                     410                     415
Val Pro Lys Gly Glu Val Gly Leu Leu Ile Cys Lys Ile Thr Glu Leu
            420                     425                     430
Thr Pro Phe Phe Gly Tyr Ala Gly Gly Lys Thr Gln Thr Glu Lys Lys
            435                     440                     445
Lys Leu Arg Asp Val Phe Lys Lys Gly Asp Val Tyr Phe Asn Ser Gly
        450                     455                     460
Asp Leu Leu Met Ile Asp Arg Glu Asn Phe Ile Tyr Phe His Asp Arg
465                     470                     475                     480
Val Gly Asp Thr Phe Arg Trp Lys Gly Glu Asn Val Ala Thr Thr Glu
                485                     490                     495
Val Ala Asp Ile Val Gly Leu Val Asp Phe Val Glu Glu Val Asn Val
                500                     505                     510
Tyr Gly Val Pro Val Pro Gly His Glu Gly Arg Ile Gly Met Ala Ser
            515                     520                     525
```

```
Ile Lys Met Lys Glu Asn Tyr Glu Phe Asn Gly Lys Lys Leu Phe Gln
    530                 535             540
His Ile Ser Glu Tyr Leu Pro Ser Tyr Ser Arg Pro Arg Phe Leu Arg
545                 550                 555                 560
Ile Gln Asp Thr Ile Glu Ile Thr Gly Thr Phe Lys His Arg Lys Val
                565             570                 575
Thr Leu Met Glu Glu Gly Phe Asn Pro Ser Val Ile Lys Asp Thr Leu
            580             585                 590
Tyr Phe Met Asp Asp Thr Glu Lys Thr Tyr Val Pro Met Thr Glu Asp
        595                 600                 605
Ile Tyr Asn Ala Ile Ile Asp Lys Thr Leu Lys Leu
    610                 615                 620
```